Technology: Microelectronics

Oriol Inc (Santa Clara, CA, USA; Tel: +1-408-327-9940) has started manufacturing and shipping blue, blue-green, green and white high-brightness LEDs on sapphire substrates (using two EMCORE SpectraBlue GaN MOCVD tools). It is also planning to expand elsewhere in California, offering die or packaged blue HB-LEDs. Next will be GaN VCSELs and GaN-based electronic devices.

Arima Optoelectronics has signed a deal to supply a DVD drive manufacturer with lasers. It installed equipment in April with an initial capacity to package 1m a month.

It also plans to move into laser wafer production in Q3/2001, initially only 630-650 nm red lasers under OEM contract but then its own-brand products (after moving into 1300-1500 nm lasers and up-stream wafer production).

With eight MOCVD systems, current capacity is 80m red/orange/yellow and 10m blue/green LEDs per month. Arima's sales were NT$200m in 2000. It predicts it will quadruple that in 2001 with the addition of lasers.

The **Uniroyal Optoelectronics** (UOE) division of Uniroyal Technology Corp (Sarasota, FL, USA) has named Advanced Semiconductor Process Integration Co Ltd as its distributor for high-brightness LED chips in South Korea.

* UOE has achieved minimum brightness output of 140-200 mcd from its 618 and 626 nm red AlInGaP/GaAs HB-LEDs (which have an integrated Bragg reflector).

* UTC's fiscal Q2/2001 sales (to end-March) were US$15.1m (down 7% on a year ago but up 11% for the Compound Semiconductor and Optoelectronics segment).

Nichia loses law-suit against Cree; while Rohm withdraws versus Nichia

In May the Tokyo District Court dismissed the lawsuit filed in December 1999 by **Nichia Corp** against **Sumitomo Corp** - one of the distributors in Japan for **Cree Inc** (Durham, NC, USA) - alleging that the device structure used in Cree's standard-brightness blue LEDs infringed Japanese Patent No. 2,918,139.

Cree subsidiary **Cree Lighting Company** (Goleta, CA, USA) then filed a lawsuit in the US District Court for the Northern District of California alleging that **Nichia Corp** and **Nichia America Corp** are infringing US Patent No. 5,686,738 "*Highly Insulating Monocrystalline Gallium Nitride Thin Films*" (relating to devices, such as LEDs, made using a GaN-based buffer technology) by importing, selling and offering for sale in the US devices made from GaN films. The patent was issued to co-plaintiff Boston University in November 1997 and licensed to Cree Lighting Company.

* **Rohm Co Ltd** (Kyoto, Japan) has withdrawn its complaint before the US International Trade Commission alleging that certain **Nichia** parts infringed two US patents. Nichia claims that this came after the ITC issued an order that would have allowed it to uncover evidence of anti-trust and conspiracy by Rohm, contending that Rohm had fabricated a domestic industry to obtain ITC jurisdiction.

This "*eliminates concern over the availability of violet and blue laser diodes in the US*," says Noboru Tazaki, managing director and general manager of Nichia's Optoelectronics Products Division.

SiC matches sapphire-based blue LEDs

Cree Inc (Durham, NC, USA) has begun volume production of its new MegaBright SiC-based blue LED, which has a typical brightness of 10 mW (double its existing UltraBright LEDs - launched last October - and matching the highest-brightness sapphire-based devices). Over the last three years, Cree has increased the brightness of its LEDs 10-fold.

New applications targeted include full-colour outdoor video displays, backlighting of full-colour PDAs, automotive backlighting, and solid-state illumination.

* Cree has also announced the election to its Board of Directors of Dr Robert J Potter (president and CEO of technology consultancy R J Potter Company, former group vp of Nortel Networks and current board member of Molex Inc, a manufacturer of interconnection products).

Toyoda to manufacture 410 nm GaN laser

Toyoda Gosei Co Ltd (Nagoya, Japan) has developed manufacturing technology for a short-wavelength (410 nm) GaN bluish-purple laser (sampling this Autumn). It has a 3 mW output and an estimated life of over 5,000 hours cw at room temperature. The new laser is based on the development of an optical wave-guiding structure and a packaging technology that excels in heat radiation.

Basic research (costing about ¥700m) was carried out over seven years under Professor Isamu Akasaki of Meijo University (Professor Emeritus of Nagoya University) and Assistant Professor Hiroshi Amano of Meijo University. The project was funded in part by Japan Science and Technology Corp, one of the key organisations for implementing the policies of Japan's Science and Technology Agency.

Using GaN, Toyoda Gosei developed the technology for stable semiconductor crystallisation, which features high-quality multi-quantum well layers.

Record 16.4%-efficient CdTe PV cell

The **National Renewable Energy Laboratory** (Golden, CO, USA) has broken the nine-year efficiency record of 15.8% for a cadmium telluride solar PV cell by using new materials that interact chemically with the CdTe to improve adhesion, light collection, and electronic properties. Two of the largest US PV plants make CdTe thin-film panels and could adopt the process if they expand. CdTe yields higher power per area at a lower price.

NREL works within the National Center for Photovoltaics (founded at NREL by the DOE in 1996) together with the National CdTe Team (scientist from university and industry) and Sandia Labs.